HBP-1100-E_A_M06_120810.pdf

OMRON

Professional Blood Pressure Monitor

HBP-1100

Instruction Manual

Thank you for purchasing this OMRON Professional Blood Pressure Monitor.
Please completely read this Instruction Manual before using the monitor for the first time.
Read this manual to ensure the safe and accurate use of the monitor.

All for Healthcare

XXXXXXX-X A

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3. The problem and damage caused by the maintenance and/or repair using the repair parts not specified by OMRON
4. The problem and damage caused by the results not observing the Notes on Safety or the operational method mentioned in this Instruction Manual
5. Under the circumstances not within the operating conditions of this unit including the power source or the setting environment mentioned in this Instruction Manual
6. The problem and damage caused by the result(s) of remodeling or improper repair of this product
7. The problem and damage caused by act of god such as fire, earthquake, flood, or lightning

1. The contents of this Instruction Manual may be changed without prior notice.
2. We have thoroughly reviewed the contents of this Instruction Manual. However, if an inadequate description or error is found, please let us know.
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Introduction

Intended Use

Medical Purpose

The device is a digital monitor intended for use in measuring blood pressure and pulse rate in adult and pediatric patient population with arm circumference ranging from 12 cm to 50 cm (from 5 inches to 20 inches).

Intended User

This device should be used by a medical professional.

Patient Population

This device is intended for use on adults and children of age 3-years and older.

Environment

The instrument is designed for use in physicians' offices, hospitals, clinics and other medical facilities.

Measurement Parameter

- Non-Invasive Blood Pressure
- Pulse rate

Precautions for Use

Warnings and cautions described in the instruction manual should be observed at all times.

Features of the Product

The blood pressure accuracy of the HBP-1100 is clinically proven. Easy to use, the HBP-1100 is intended for use by medical professionals.

- Zero indicator function (page 14): Before each measurement, this device indicates that "zero calibration" was successful.
- Auscultation mode
- 5 cuffs available - (XL: 42 to 50 cm, L: 32 to 42 cm, M: 22 to 32 cm, S: 17 to 22 cm, SS: 12 to 18 cm)
- This device and cuff can be cleaned with a soft cloth moistened with alcohol.
- Compact, can be stored in a drawer
- Motion stop function: When body movement is detected, this device stops deflation for 5 seconds.
- Irregular pulse icon: Helps identify changes in heart rate, rhythm, and pulse that may be caused by heart disease or other serious health problems.

Notes on Safety

The warning signs and symbol examples indicated below are intended to ensure safe use of the product and prevent damage and injury to you and others. The signs and symbols are explained below.

Safety Symbols used in this Instruction Manual	
⚠ **Warning**	Indicates the matters in which death or severe bodily damage may arise as a result of incorrect handling.
⚠ **Caution**	Indicates the matters in which bodily harm or material damage may arise as a result of incorrect handling.

General Information
Note: Indicates general information to keep in mind when using the unit and other useful information.

Setup

⚠ Warning

- Do not use the cuff or AC adapter to lift the unit, it can also cause the unit to malfunction.
- If the unit has broken down, contact your local OMRON representative.
- Do not use in combination with a hyperbaric oxygen therapy device, or in an environment where combustible gas may be generated.
- Do not use in combination with magnetic resonance imaging (MRI) equipment. If MRI is to be performed, remove cuff connected to the unit from the patient.
- Do not use with a defibrillator.
- Do not install the unit in the following locations:
  - Locations subject to vibration such as ambulances and emergency helicopters.
  - A location where there is gas or flame.
  - A location where there is water or steam.
  - A location where chemicals are stored.
- Do not use at extremely high temperature, high humidity, or high altitude. Use only within the required ambient conditions.
- Do not subject the unit to intense shock.
- Do not place heavy objects on the AC adapter cable, or allow the unit to sit on the cord.
- Clinical testing has not been conducted on newborn infants and pregnant women. Do not use on newborn infants and pregnant women.
- Do not plug in or unplug the AC adapter with wet hands.

⚠ Caution

- Do not install the unit in the following locations:
  - Locations with dust, salt, or sulfur.
  - Locations directly exposed to sunlight for extended periods of time (in particular, do not leave in direct sunlight or near a source of ultraviolet light for extended periods, as ultraviolet light will cause deterioration of the LCD).
  - Locations subject to vibration or shock.
  - Near heaters.
- Do not use the unit near large equipment that uses a switching relay for power ON/OFF.

Before use / during use

⚠ Warning

- The unit complies with the EMC standard (IEC60601-1-2). As such, it can be used simultaneously with multiple medical instruments. However, if instruments that generate noise such as an electric scalpel or a microwave therapy device are near the unit, check the operation of the unit during and after use of these instruments.
- If an error occurs or a measurement result is questionable, check the vital signs of the patient by auscultation or palpation. Avoid relying solely on the measurement results of the unit when judging the patient's condition.
- Only trained healthcare providers should use this device. Do not allow patients to operate this device.
- Properly connect the connectors and AC adapter cable.
- Do not place objects or liquids on top of this unit.
- Check the following before using the unit:
  - Make sure the AC adapter cable is not damaged (wires are not exposed or broken), and the connections are firm.
- For the AC adapter connected to the unit, supplies, and optional devices, use only the standard accessories or OMRON-specified products.
- Do not use in a location with moisture, or a location where water may splash on the unit.
  This unit is intended for use in a physician's office.
- Do not use the unit if it emits smoke, an abnormal odor, or abnormal noise.
- Do not bring cellular telephones or transceivers into the room where the unit is installed or being used.
- Do not connect multiple monitors to the same patient.
- Do not connect the unit to a power outlet that is controlled by a wall switch.

⚠ Caution

- Before using the unit, verify that none of the following apply to the patient:
  - Poor peripheral circulation, noticeably low blood pressure, or low body temperature (there will be low blood flow to the measurement position)
  - The patient uses an artificial heart and lung (there will be no pulse)
  - An SpO_2 sensor and the cuff are attached to the same arm
  - The patient has an aneurysm
  - The patient has frequent arrhythmia
  - Body motions such as convulsions, arterial pulsations, or trembling (cardiac massage in progress, minute continuous vibrations, rheumatism, etc.)
- Before use, visually inspect the unit to make sure there are no deformations due to falling, and that there is no dirt or moisture on the unit.
- When the unit has not been used for an extended period of time, always verify that it operates normally and safely before use.
- Do not use in a location where the unit may easily fall. In the event that the unit falls, verify that it operates normally and safely.

Cleaning

⚠ Warning

- When cleaning the unit, turn off the power and disconnect the AC adapter from the unit.
- After cleaning the unit, make sure it is completely dry before connecting to a power outlet.
- Do not spray, pour, or spill liquids into or onto the unit, accessories, connectors, buttons, or openings in the housing.

⚠ Caution

- Do not use thinner, benzene, or other solvents to clean the unit.
- Do not sterilize by autoclave or gas sterilization (EOG, formaldehyde gas, high-concentration ozone, etc.).
- If using an antiseptic solution for cleaning, follow the instructions of the manufacturer.
- Clean the unit regularly.

Maintenance and inspection

⚠ Warning

- To use the unity safely and correctly, always inspect the unit when starting work.
- Unauthorized modification is prohibited by law. Do not attempt to disassemble or modify the unit.

Dry cell battery

⚠ Warning

- If battery fluid comes in contact with the eye, immediately flush with copious amounts of water. Do not rub. Seek medical attention immediately.
- Do not throw into flame, disassemble, or heat.
- Always disconnect the AC adapter from the unit before removing or installing a battery.
- If the unit will not be used for a month or longer, remove the battery from the unit and store.
- Do not attempt to disassemble or modify the battery.
- Do not apply pressure to and deform the battery. Do not throw, pound, drop, bend, or hit the battery.
- The battery has positive/negative polarity. Do not insert batteries with their polarities reversed.
- Do not connect the positive and negative terminals of the battery with a wire or other metal object.
- Do not use the AC adapter and battery at the same time.

⚠ Caution

- If battery fluid comes in contact with skin or clothing, rinse immediately with water.
- Do not use new and old batteries together, or use different types of batteries together.

Non-Invasive Blood Pressure (NIBP) measurement

⚠ Warning

- If a cuff is used on a patient with an infection, treat the cuff as medical waste, or sterilize before reuse.
- If frequently performing NIBP measurement using a cuff over an extended period of time, periodically check the patient's circulation. In addition, wrap the cuff as indicated in the cautionary points in this manual.
- Do not connect the NIBP cuff or cuff joint to a luer lock adapter.
- Do not bend cuff tube during inflation and deflation, particularly after a change of body position.
- Do not wrap the cuff on the following parts:
  - An upper arm on which intravenous drip or a blood transfusion is being performed.
  - An upper arm on which SpO_2 sensor, IBP catheter, or other instrument is attached.
  - An upper arm with a shunt for hemodialysis
- If measuring blood pressure with the cuff wrapped on the arm on the side of the body where a mastectomy was performed, check the patient's condition.

⚠ Caution

- NIBP measurement should be performed on the upper arm.
- During NIBP, stop excessive body movement by the patient and minimize trembling.
- If a doctor has indicated that the patient has hemorrhagic diathesis or hypercoagulability, check the condition of the arm after measurement.
- Use the appropriate cuff size to ensure correct measurements. If too large a cuff is used, the measured blood pressure value tends to be lower than the actual blood pressure. If too small a cuff is used, the measured blood pressure value tends to be higher.
- Before and during measurement, verify that none of the following apply to the patient:
  - An inappropriate cuff size is used.
  - The part where the cuff is wrapped is at a different height than the heart.
    (A difference of 10 cm (4 inches) in height may cause a variation in the blood pressure value of up to 7 or 8 mmHg.)
  - Body movement or conversing during measurement.
  - Cuff wrapped over thick clothing.
  - Pressure on the arm due to a rolled up sleeve.
- In the case of a cuff for adults, the cuff should be wrapped to a tightness that allows two fingers to be inserted in between the cuff and the arm.
- The accuracy of a flashing measurement value that is out of the measurement range cannot be guaranteed. Always check the patient's condition before deciding what steps to take.
- Do not use the cuff if it is damaged or has holes.
- Only an OMRON GS CUFF can be used with this device. The use of any other cuff may result in incorrect measurement.

Note:

Setup

- Read and understand the manual for each optional accessory. This manual does not contain cautionary information for optional accessory.
- Exercise caution with the cables and arrange so that the patient does not become entangled or bound.

Before use / during use

- Check the following after turning on the power:
  - No smoke, abnormal odor, or abnormal sound is emitted.
  - Press each button and verify that it operates.
  - For functions that cause icons to light or flash, verify that the icons light or flash.
  - Measurement can be performed normally, and measurement error is within the tolerance value.
- If the screen is not displayed normally, do not use the unit.
- When recycling or disposing of parts (including batteries) of the unit, follow local government rules and regulations.

Cleaning

- For cleaning, see page 23.

Non-Invasive Blood Pressure (NIBP) measurement

- If the patient has acute inflammation, a pyogenic ailment, or an external wound at the location where the cuff is to be wrapped, follow the instructions of the doctor.
- Non-Invasive Blood Pressure measurement (NIBP) is performed by compressing the upper arm.
  Some people may experience intense pain, or transient spotting caused by subcutaneous hemorrhaging (bruising) may appear. The spotting will disappear with time; however, it may be appropriate to inform patients for whom this may be a concern that spotting sometimes occurs, and if necessary, refrain from measurement.
- To measure correctly, it is recommended that the patient relax and not talk during measurement.
- To measure correctly, it is recommended that the patient rest quietly for 5 minutes before measurement.

Using the Unit

Components of the Product

Before using the unit, make sure that no accessories are missing and that the unit and accessories are not damaged. If an accessory is missing or there is damage, please contact your local OMRON representative.

Main unit

Standard Medical Accessories

AC adapter

GS CUFF M

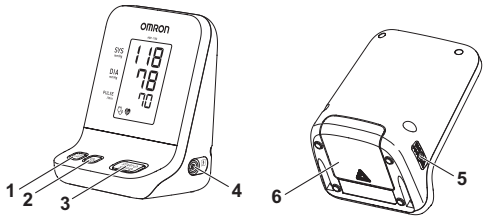
Instruction Manual

Caution

- Only an OMRON GS CUFF can be used with this device. The use of any other cuff may result in incorrect measurement.

Features / Functions of Unit

Front and bottom of unit

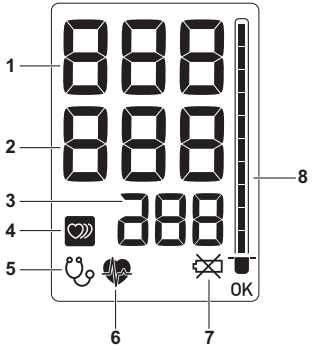


1	POWER	[Power ON/OFF] button	Turns the power ON/OFF.
2		[Auscultation] button	Press to enter auscultation mode. (page 20).
3	START / STOP	[START/STOP] button	Press to start blood pressure measurement. While the cuff is inflating, hold down to continuously inflate (page 18).
4		NIBP connector	Connects the cuff tube.
5		Power connector	Connects the AC adapter.
6		Battery cover	Open to install or replace the batteries.

Other symbols

Symbol	Description	Symbol	Description
	Type BF		Caution
	Class II Internal powered equipment		

LCD Display



1		SYS	Displays systolic blood pressure.
2		DIA	Displays diastolic blood pressure.
3		Pulse	Displays the pulse rate.
4		Irregular pulse wave icon	Lights in the measurement result display if the pulse wave interval was irregular or there was body movement during measurement.
5		Auscultation icon	Lights when "Auscultation Mode" is ON.
6		Pulse synchronization icon	Flashes in synchronization with the pulse during measurement.
7		Battery replacement icon*	When this icon lights, an E40 error also appears. Replace the batteries. (page 13)
8		Zero indicator icon	Lights when "zero calibration" is being performed prior to blood pressure measurement. When calibration finishes, OK appears.

* Only when the batteries are installed.

Installing the Batteries

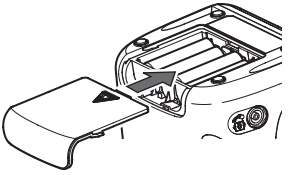
Warning

- If battery fluid comes in contact with the eye, immediately flush with copious amounts of water. Do not rub. Seek medical attention immediately.
- Do not throw into flame, disassemble, or heat.
- Do not attempt to disassemble or modify the battery.
- Do not use the AC adapter and battery at the same time.

Caution

- If battery fluid comes into contact with the skin or clothes, immediately rinse with water.

1. **Make sure the AC adapter has been disconnected.**
2. **Remove the battery cover from the bottom of the unit.**
3. **Insert the batteries in the correct orientation.**
4. **Replace the battery cover.**



Battery replacement icon

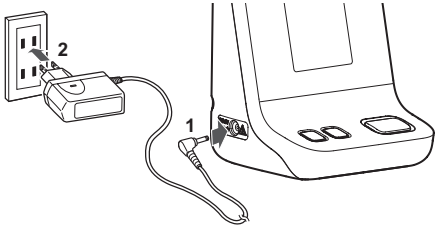
When this icon lights, an E40 error also appears. Replace the batteries.

Connecting the AC Adapter

AC power

Verify that the power outlet supplies the specified voltage and frequency (100 - 240 V AC, 50/60 Hz).

Connect the AC adapter to the power connector on the unit and the power outlet.



Cuff Selection and Connection

Warning

- Treat a cuff used on a patient with an infection as medical waste, or sufficiently sterilize the cuff before reuse.

Caution

- Do not use the cuff if it is damaged or has holes.
- Use the appropriate cuff size to ensure correct measurements. If too large a cuff is used, the measured blood pressure value tends to be lower than the actual blood pressure. If too small a cuff is used, the measured blood pressure value tends to be higher.
- Only an OMRON GS CUFF can be used with this device. The use of any other cuff may result in incorrect measurement.

Note:

- It is important to use the correct sized cuff for a patient in order to get an accurate reading.

Selecting the cuff

Measure the circumference of the patient's arm and select the cuff size that is appropriate for the circumference.

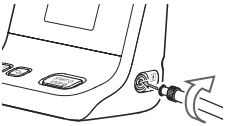
Select the cuff that is suitable for the patient from the cuffs below.

Cuff name	Arm circumference	
	(cm)	(inch)
GS CUFF XL*	42 - 50	17-20
GS CUFF L*	32 - 42	13-17
GS CUFF M	22 - 32	9-13
GS CUFF S*	17 - 22	7-9
GS CUFF SS*	12 - 18	5-7

*Available as an optional accessory.

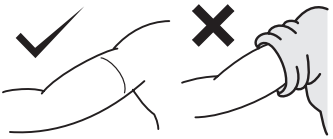
Connecting the cuff

Connect the cuff tube to the NIBP connector on the unit and turn clockwise to lock.

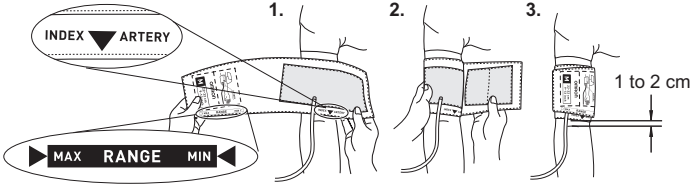


Applying the Cuff to the Patient

The device can be used on either the right or left arm.
Wrap the cuff on a bare arm or over thin clothing. Thick clothing or a rolled up sleeve will cause inaccurate blood pressure measurements.



1. **Make sure the cuff tube is not bent.**
   The cuff tube should be on the peripheral side.
2. **Wrap the cuff so that the INDEX ARTERY "▼" is directly over the brachial artery.**
   The brachial artery is on the inner side of the patient's upper arm.



Make sure that the INDEX ARTERY "▼" is within the ▶ MAX RANGE MIN ◀ range. If outside the range, there will be greater error in the blood pressure value. In this case, use the appropriate cuff size.

* Attach the cuff so that the bottom edge is 1 to 2 cm from the inner side of the elbow joint.
* The cuff should be wrapped to a tightness that roughly allows two fingers to be inserted under the cuff.

3. **During measurement, keep the brachial artery on which the cuff is wrapped at the same height as the right atrium of the heart.**

Caution

- Make sure the cuff is wrapped in the correct arm position and is at the same height as the heart.

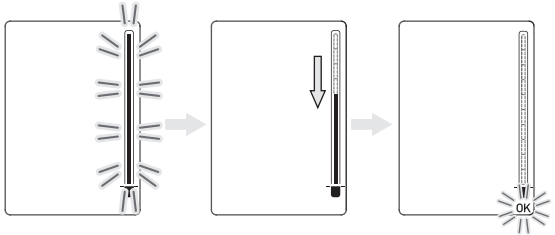
NOTE:

- If measurement is difficult due to arrhythmia, use a different blood pressure measurement method.
- If the patient has acute inflammation, a pyogenic ailment, or an external wound at the location where the cuff is to be wrapped, follow the instructions of the doctor.
- Non-Invasive Blood Pressure (NIBP) measurement is performed by compressing the upper arm. Some people may experience intense pain, or transient spotting caused by subcutaneous hemorrhaging may appear. The spotting will disappear over time, however, if it is possible that this will disturb the patient, try the following technique:
  -Wrap a thin towel or cloth (one layer) under the cuff.
  If the towel or cloth is too thick, there will be insufficient cuff compression and the blood pressure value will measure high.
- If the patient moves or the cuff is touched, this may be falsely detected as a pulse and over-inflation will occur.
- Do not inflate the cuff when it is not wrapped on the upper arm. This may damage the cuff.

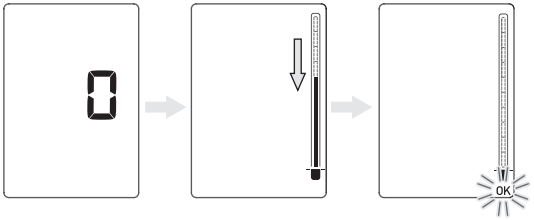
Zero indicator function

Before each measurement, this device indicates that “zero calibration” was successful.

■ When the power is turned on, “zero calibration” starts after the entire indicator blinks. When completed, OK appears.



■ When the power is already on, “zero calibration” takes place from the ready screen (which shows “0”). When completed, OK appears.



Non-Invasive Blood Pressure (NIBP) Measurement

Measurement in normal mode

1. Press the [START/STOP] button.

Blood pressure measurement is performed once.

2. The measurement results are displayed.

If a measurement value is outside the corresponding range below, the value will flash.

SYS: 59 mmHg or less, or 251 mmHg or higher.

DIA: 39 mmHg or less, or 201 mmHg or higher.

PULSE: 39 bpm or less, or 201 bpm or higher.

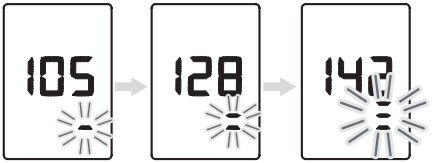
■ Normal measurement

■ Measurement error / failure

Manual inflation in normal mode

If the cuff is not sufficiently inflated, it can be inflated manually. During inflation, hold down the [START/STOP] button to inflate continuously.

"-" appears below the value to indicate that manual inflation is in progress.



Caution

- The accuracy of a flashing measurement value that is outside the measurement range is not guaranteed. Always check the patient's condition before deciding what steps to take.

NOTE:

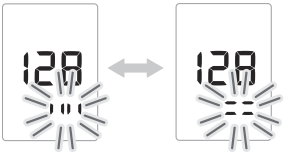
- If inflation is insufficient, inflation may restart automatically while measurement is in progress.

Irregular pulse wave detection function

If the pulse wave interval becomes irregular during measurement, the irregular pulse wave detection icon will light to notify you.

Motion stop function

If body movement is detected during measurement, deflation stops for 5 seconds and "-" "|" blink below the value.



After 5 seconds, measurement resumes, and an attempt is made to complete measurement in one cycle.

NOTE:

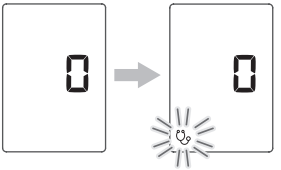
- When the motion stop function has activated, the irregular pulse wave icon appears in the measurement result.

Measurement in auscultation mode

In auscultation mode, this device does not measure blood pressure.

Measurement should be performed by a health care professional using a stethoscope.

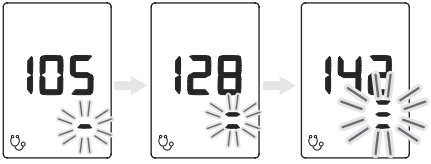
The healthcare professional uses a stethoscope to determine SYS and DIA by means of the auscultation method.



1. **Make sure the power is on.**
   "0" is displayed.
2. **Press the [Auscultation] button.**
   The auscultation icon appears and the device enters auscultation mode.
3. **Press the [START/STOP] button.**
   Inflation starts. When the cuff is sufficiently inflated, deflation automatically starts.
4. **At the SYS point that you determine by auscultation, press the [Auscultation] button.**
   The first time you press the [Auscultation] button, the SYS value appears.
5. **At the DIA point that you determine by auscultation, press the [Auscultation] button.**
   The second time you press the [Auscultation] button, the DIA value appears and the cuff rapidly deflates.

Manual inflation in auscultation mode

If the cuff is not inflated sufficiently or you want to re-inflate, you can inflate the cuff manually.
Hold down the [START/STOP] button during inflation or deflation to inflate continuously.
"-" appears below the value to indicate that manual inflation is in progress.



NOTE:

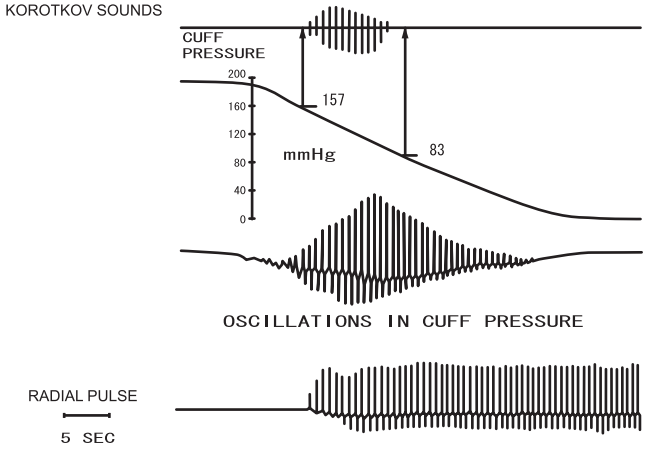
- The body movement detection function is disabled while "Auscultation Mode" is in use.
- In auscultation mode, the pulse rate is not measured and does not appear.

Stopping the Measurement

To stop measurement while measurement is in progress, press [START/STOP] button.

Oscillometric method

The beat in the pulsation generated by the contraction of the heart is captured as the pressure inside the cuff to measure the blood pressure. If the cuff wrapped around the upper arm is pressurized sufficiently, the blood flow stops, but the beat of the pulsation is present and the pressure inside the cuff receives this and oscillates. Next, as the pressure inside the cuff gradually decreases, the oscillation of the pressure within the cuff gradually increases and reaches a peak. As the pressure within the cuff decreases further, the oscillation decreases from its peak.
The pressure within the cuff and the relationship with the increase and decrease of the oscillation within the cuff in this series of processes are stored into memory, calculations are carried out, and the blood pressure value is determined.
The pressure within the cuff when the oscillation increases drastically is the systolic pressure and the pressure within the cuff when the oscillation decreases drastically is the diastolic pressure. Also, the pressure within the cuff when the oscillation peaks is taken as the average pulsation pressure.
The oscillometric method does not determine the blood pressure value instantly like a microphone type automatic blood pressure gauge with the auscultation method, but rather determines it from the series of change curves as explained above. Therefore, it is not easily affected by external noise, an electric scalpel or other electro surgical instruments.



Comparison between the auscultatory, oscillometric and palpatory methods of measuring blood pressure.

L.A. Geddes,
" The Direct and Indirect Measurement of Blood Pressure ", Year Book Medical Publishers, Inc. 1970

Maintenance

Maintenance Inspection and Safety Management

The HBP-1100 must be maintained to ensure functionality and to secure the safety of patients and operators.
Daily checks and maintenance should be performed by the operator.
In addition, qualified personnel are necessary to maintain the performance and the safety, and to conduct periodic inspections. We recommend that the verification test be performed at least once a year.

Device Maintenance

Cleaning and disinfecting should be performed in accordance with your facility's infection control practice.
Wipe with a cloth that has been moistened with isopropyl alcohol diluted to 50 v/v%, or ethyl alcohol (disinfection alcohol) diluted to 76.9 - 81.4 v/v% and wrung out.
Do not wipe the Power connector or allow it to become wet.
Use a moistened cotton bud to remove dust that has accumulated on the vent ports.
The device requires no routine service other than cleaning, and visually checking the cuffs, tubing, etc.

Caution

- Do not sterilize by autoclave or gas sterilization (EOG, formaldehyde gas, high-concentration ozone, etc.).
- If using an antiseptic solution for cleaning, follow the instructions of the manufacturer.

Accessory Care

Non-Invasive Blood Pressure Measurement (NIBP)

Cuff/Cuf tube
Wipe clean on the surface of the cuff with a cloth moistened with a 70 v/v% dilution of isopropyl alcohol, or a 76.9 to 81.4 v/v% dilution of disinfection ethanol (ethyl alcohol).
Do not allow any liquids inside the cuff. If a liquid gets in the cuff, dry the in

Managing Supplies

Keep the following supplies on hand.

- GS CUFF - All sizes
- Battery

Before turning on the power

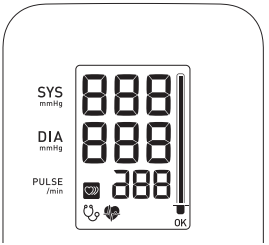
Before turning on the power, check for the following

■ External appearance
- The device or accessories are not deformed due to falling or other impact.
- The device is not dirty.
- The device is not wet.

■ AC adapter
- The AC adapter is firmly connected to the connector on the device.
- There are no heavy objects lying on the AC adapter cable.
- The AC adapter cable is not damaged (core-wire exposure, breaks, etc.).

When turning on the power

When you turn on the power, check the LCD display.
- When the [START/STOP] button is pressed to turn on the power, the screen below appears and the alarm lamp lights.



After turning on the power

After turning on the power, check for the following

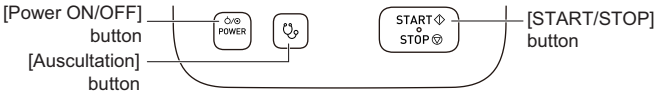
■ External appearance
- There is no smoke or odor coming from the device.
- The device is not making any unusual noises.

■ Buttons
- Press each button and check that it works.

■ Non-invasive blood pressure (NIBP)
- Make sure that a suitable OMRON GS CUFF is attached (one that fits the circumference of the patient's arm).
- The cuff tube is firmly connected.
- The person checking the cuff should wrap the cuff around arm, perform cuff measurement and check to see that blood pressure is in the vicinity of normal measurements.
- While measurement is in progress, bend the relevant arm and move body to halt discharge and during this halt check that cuff pressure does not drop.

Checking pressure accuracy

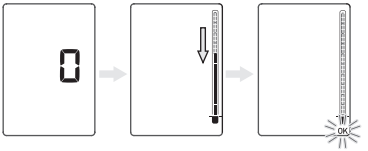
You can check the pressure accuracy of the device.



1. Make sure the power is on.

2. Hold down the [Auscultation] button for 3 seconds.

"Zero calibration" is performed.
When calibration is finished, the pressure accuracy verification screen appears.

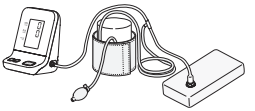


3. Check the "0" display, and perform the pressure accuracy check.

Apply the external pressure.
Compare with the displayed value and make sure there is no problem.

Example:

1. Connect the blood pressure monitor, the standard pressure gauge, and the cuff and rubber ball.



2. Check the blood pressure value of the blood pressure monitor and the blood pressure value of the standard pressure gauge.

Note:

- The standard is within ± 3 mmHg or 2 % of manometer reading.

4. Turn off the power and exit utility mode.

Troubleshooting

The power does not turn on	
Cause	Solution
If the unit is being powered by the batteries, the batteries are not installed or depleted.	Insert batteries or replace with new batteries (page 13).
The AC adapter is disconnected.	Connect the AC adapter (page 13).
If the power does not turn on and the above is not the cause, turn off the unit power, disconnect the AC adapter, remove the batteries, and contact your local OMRON representative.	

The unit display does not operate
Cause / solution
Stop using the unit and contact your local OMRON representative.

The unit becomes hot	
Cause	Solution
An object is on top of the unit or right next to the unit.	Keep the area around the unit free of objects.
If the unit becomes too hot to be touched, there may be a problem in the unit. Turn off the unit power, disconnect the AC adapter, remove the batteries, and contact your local OMRON representative.	

The cuff does not inflate when the [START/STOP] button is pressed	
Cause	Solution
Loose cuff tube connection.	Check the connection.
There is an air leak in the cuff.	Replace the cuff.
If pressure is displayed, the cuff tube is bent.	Make sure no part of the cuff tube is bent.

Measurement was not possible
Cause / solution
Check the patient by palpation or other method. After checking the patient, check the error code and see "List of Error Codes" (page 29) for Non Invasive Blood Pressure (NIBP) measurement.

Abnormal measurement value
Cause / solution
The causes below are possible. Check the patient by palpation and then repeat measurement. • Body movement (chills or other trembling) • Arrhythmia. • Noise in the cuff - A nearby person touched the patient. - Cardiac massage was being performed.

The measurement value is questionable	
Cause	Solution
Deflates quickly	Check for a loose cuff connection.
Incorrect cuff size used.	Measure circumference or patient's arm and ensure correct sized cuff is used.
Cuff wrapped over thick clothing.	Ensure cuff is applied to a bare arm, or very thin clothing.
Patient not seated properly.	Ensure patient is seated, feet flat on the floor, cuff at heart level.
Patient ate, drank, or exerted themselves recently.	Ensure before measurement taken, patient has not had food, caffeinated or alcohol beverages, or exerted/ exercised in the last 30 minutes.

Simultaneously perform measurement with a stethoscope.
Place the stethoscope and listen while viewing the pressure display of the manometer.

Blood pressure may vary widely due to physiological effects.
The causes below are possible.

- Emotional excitement or agitation
  - Pain due to cuff wrapping
  - White coat hypertension
- Cuff size or wrapping method not correct
- Cuff wrapping position on upper arm not at the same height as the heart
- Patient's blood pressure not stable due to pulsus alternans, respiratory changes, or other reason

List of Error Codes

■ Example: E2

SYSTEM

Error code	Description	Points to check
E9	• Sensor failure • EEPROM failure • Switch error	Contact your local OMRON representative.

NIBP

Error code	Description	Points to check
E1	The cuff tube is not connected	Firmly connect the cuff tube.
	Air is leaking from the cuff.	Replace with an OMRON GS CUFF that does not leak.
E2	Did not inflate properly because the arm or body moved during measurement.	Have the patient not move the arm or body, and repeat measurement.
	Moved body or arm during measurement, or talked.	Have the patient not talk or move, and repeat measurement.
	The cuff is not applied correctly.	Correctly apply the cuff.
	The sleeve is rolled up and is compressing the arm.	Remove the garment and re-wrap the cuff.
	Measurement time has exceeded specified time. Specified time: 165 seconds	The measurement time exceeds the expected time, so the measurement was ended in order to avoid patient discomfort. There is a possibility that measurement is being repeated over and over due to air leaking from the cuff.

Other problems

Error code	Description	Points to check
E3	Cuff inflated to 300 mmHg or higher during manual inflation in auscultation mode	When inflating manually in auscultation mode, release the button when the pressure reaches the desired value.
	Over-inflation occurs	If this occurs during measurement, repeat measurement. If this occurs when not performing measurement, contact your local OMRON representative.
E40	The batteries are depleted.	Replace with new batteries. (page 13)
E42	Battery voltage error	Replace the batteries with new batteries. If the error continues, contact your local OMRON representative.

Disposal

As there is a risk of environmental pollution, follow your applicable national and local legal regulations regarding disposal or recycling of this equipment and batteries.
The main constituents of each part are listed in the table below. As there is a risk of infection, do not recycle patient attachments such as cuffs, but dispose of them as instructed by your facility's procedures and applicable regulations.

Item	Parts	Material
Package	Box	Cardboard
	Cushion	Cardboard
	Bag	PE
Main unit	Enclosure	ABS, PC , SR
	Interema	General electronic components
Battery	AA battery	Battery (Commercially available)
Cuff / Cuff tube	Cuff	C3604B
	Tube	PVC
	Connector	Nickel
AC adapter	Enclosure	PC
	Code	PVC
	Internal parts	General electronic components

Specifications

Specifications

Main unit

Measurement Parameter	NIBP, PR
Dimension	Main unit: 120 x 190 x 110 (mm) 4.72 x 7.48 x 4.33 (inch) (W x H x D) AC adapter: 46 x 66 x 37 (mm) 1.81 x 2.60 x 1.46 (inch) (W x H x D)
Weight	Main unit: Approx. 0.6 kg (not including accessories and options) AC adapter: Approx. 0.2 kg
Display	7 segment LCD
Safety Standards	IEC 60601-1:1988+A1:1993+A2:1995 Medical electrical equipment-Part1:General requirements for safety
Protection Class	Class Ⅱ Internal powered equipment
Degree of Protection	Type BF
MDD Classification	Class Ⅱ a

Power supply

AC adapter	Input voltage range: AC 100 V to 240 V
	Rated Current: 0.5 A
	Frequency: 50/60 Hz
	Output voltage range: DC 6 V ±5%

Dry cell battery	Type: AA batteries, x4 Number of operation cycles when fully charged: 250 • Measurement conditions - New battery fully charged (AA high-performance manganese) - Ambient temperature of 23°C (73.4°F) - Using M-size cuff - SYS120 / DIA80 / PR60 - One 5-minute cycle consisting of "cuff measurement time + wait time"

Environmental Conditions

Environmental Conditions	Temperature range: 5 to 40°C (41 to 104°F)
	Humidity range: 15 to 85%RH (not condensed)
	Atmospheric pressure: 700 to 1060hPa
Storage and transportation	Temperature range: -20 to 60°C (-4 to 140°F)
	Humidity range: 10 to 95%RH (not condensed)
	Atmospheric pressure: 500 to 1060hPa
EMC: Reference standard	IEC60601-1-2:2007 Medical electrical equipment - Part 1-2: General requirements for basic safety and essential performance - Collateral standard: Electromagnetic compatibility - Requirements and tests.

Non-Invasive Blood Pressure (NIBP)

Measurement technology	Pulse rate accuracy
Measurement method	Dynamic Linear Deflation method
Pressure display range	0 to 300 mmHg
Pressure display accuracy	Within ±3 mmHg or 2 %
NIBP measurement range	SYS 60 to 250 mmHg DIA 40 to 200 mmHg Pulse rate 40 to 200 /min
NIBP accuracy*	Maximum mean error within ±5 mmHg Maximum standard deviation within ±8 mmHg
Pulse rate accuracy	Within ±5 % of reading
Reference Standard:	ANSI/AAMI SP-10:2002+A1:2003+A2: 2006/(R)2008 ISO81060-2:2009

* Comparison with auscultation method performed by a trained professional.
DIA determined by the auscultation method is "K5".

Important information regarding Electro Magnetic Compatibility (EMC)

With the increased number of electronic devices such as PC's and mobile (cellular) telephones, medical devices in use may be susceptible to electromagnetic interference from other devices. Electromagnetic interference may result in incorrect operation of the medical device and create a potentially unsafe situation. Medical devices should also not interfere with other devices.

In order to regulate the requirements for EMC (Electro Magnetic Compatibility) with the aim to prevent unsafe product situations, the EN60601-1-2:2007 standard has been implemented. This standard defines the levels of immunity to electromagnetic interferences as well as maximum levels of electromagnetic emissions for medical devices.

This medical device manufactured by your local OMRON representative conforms to this EN60601-1-2:2007 standard for both immunity and emissions.
Nevertheless, special precautions need to be observed:

- Do not use mobile (cellular) telephones and other devices, which generate strong electrical or electromagnetic fields, near the medical device. This may result in incorrect operation of the unit and create a potentially unsafe situation. Recommendation is to keep a minimum distance of 7 m. Verify correct operation of the device in case the distance is shorter.

Further documentation in accordance with EN60601-1-2:2007 is available within this manual, refer to section "Manufacturer's Declaration".

Correct Disposal of This Product
(Waste Electrical & Electronic Equipment)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this product from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

This product does not contain any hazardous substances.

Disposal of used batteries should be carried out in accordance with the national regulations for the disposal of batteries.

Manufacturer's Declaration

The HBP-1100 is intended for use in the electromagnetic environment specified below.
The customer or the user of the HBP-1100 should assure that it is used in such an environment.

Electromagnetic Emissions (IEC60601-1-2)

Emission Test	Compliance	Electromagnetic Environment
RF emission CISPR 11	Group 1	The HBP-1100 uses RF energy only for internal functions. Therefore, this RF emission is extremely weak and there is little chance of it creating any kind of interference whatsoever with nearby electronic equipment.
RF emissions CISPR 11	Class B	The HBP-1100 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker IEC 61000-3-3	Complies	

Electromagnetic Immunity (IEC60601-1-2)

Immunity test	IEC60601-1-2 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electric fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T for 0.5 cycle	<5 % U_T for 0.5 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the HBP-1100 requires continued operation during power mains interruptions, it is recommended that the HBP-1100 be powered from an uninterruptible power supply or batteries.
	40 % U_T for 5 cycles	40 % U_T for 5 cycles	
	70 % U_T for 25 cycles	70 % U_T for 25 cycles	
U_T: Rated voltage of test unit	<5 % U_T for 5 sec.	<5 % U_T for 5 sec.	
Power frequency (50/ 60 Hz) magnetic field IEC 61000-4-8	3 A/m (r.m.s)	3 A/m (r.m.s)	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Note: U_T is the a.c. mains voltage prior to application of the test level.			

Immunity test	IEC60601-1-2 test level	IEC60601-1-2 test level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3 Vrms 150 kHz to 80 MHz 80% AM (2Hz) 3 Vrms 80 MHz to 2.5 GHz 80% AM (2Hz)	3 Vrms 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the HBP-1100, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommend separation distance** $d = 1{,}2$ $d = 1{,}2$ 80 MHz - 800 MHz $d = 2{,}3$ 800 MHz - 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to he transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters as determined by an electromagnetic site survey*, should be less than the compliance level in each frequency range**. Interference may occur in the vicinity of equipment marked with the following symbol:

Note1: At 80 MHz and 800 MHz, the higher frequency range applies.
Note2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.

* Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the HBP-1100 is used exceeds the applicable RF compliance level above, the HBP-1100 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the HBP-1100.
** Over the frequency range 150 kHz to 80MHz, field strengths should be less than 3 V/m.

Recommended Separation Distances:

Recommended separation distance between portable and mobile RF communications equipment and the HBP-1100

The HBP-1100 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the HBP-1100 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the HBP-1100 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter (W)	Separation distance according to frequency of transmitter (m)		
	150 kHz to 80 MHz $d = 1,2$	80 MHz to 800 MHz $d = 1,2$	800 MHz to 2.5 GHz $d = 2,3$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

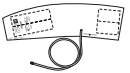
Note1: At 80MHz and 800MHz, the separation distance for the higher frequency range applies

Note2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

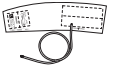
Optional Accessories

Optional Medical Accessories

AC adapter
60240HW5SW



GS CUFF XL
HXA-GCUFF-XLLB



GS CUFF L
HXA-GCUFF-LLB

GS CUFF M
HXA-GCUFF-MLB

GS CUFF S
HXA-GCUFF-SLB

GS CUFF SS
HXA-GCUFF-SSLB

Instruction Manual

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Production facility	**OMRON (DALIAN) CO., LTD.** Dalian, CHINA

Made in China